AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

Claims 1-7 (Cancelled).

8. (Previously presented) A multiple axis vibration detection system, comprising:

a light source that directs a beam of light;

a light receiving system that receives at least a portion of the beam of light;

a first light modulating system that modulates the light beam received by the light receiving system so as to correspond with vibration of a machine;

a second light modulating system that modulates the light beam received by the light receiving system so as to correspond with vibration of the machine, the second light modulating system being in series to the first light modulating system; and

a processing system that analyzes data received from the light receiving system to determine vibration of the machine in a plurality of axes.

9. (Previously presented) The system of claim 8, at least one of the first light modulating system and the second light modulating system include an obstruction modulator that obstructs the beam of light so that only a portion of the beam of light is received by the light receiving system.

10. (Previously presented) The system of claim 9, the obstruction modulator obstructs the light beam when the machine is vibrating.

11. (Previously presented) The system of claim 9, the obstruction modulator obstructs the light beam when the machine is not vibrating.

12. (Withdrawn) A system for sensing vibration of a machine, comprising:

a light source for directing a beam of light;

a light receiving system for receiving at least a portion of the beam of light;

a first waveguide for transmitting the beam of light, the first waveguide adapted to vibrate in response to vibration of the machine; and

a second waveguide having at least a portion thereof located within a predetermined distance to at least a portion of the first waveguide such that evanescent coupling occurs between the waveguides whereby the second waveguide transmit the at least a portion of the beam of light to the receiving system;

wherein the intensity of the at least a portion of the beam of light varies as a function of the vibration of the machine.

13. (Withdrawn) The system of claim 12, further including a third waveguide having at least a portion thereof located within a predetermined distance to at least a portion of the first waveguide such that evanescent coupling occurs between the waveguides whereby the third waveguide transmits light to a second light receiving system.

14. (Withdrawn) The system of claim 13, further including a fourth waveguide having at least a portion thereof located within a predetermined distance to at least a portion of the first waveguide such that evanescent coupling occurs between the waveguides whereby the fourth waveguide transmits light to a third light receiving system.

15. (Withdrawn) The system of claim 14, the second, third and fourth waveguides providing for multiple axis vibration detection.

16. (Withdrawn) A system for sensing vibration of a machine, comprising:

first, second and third light sources for directing beams of light of different frequencies, respectively;

a light receiving system for receiving at least portion of the beams of light;

a first waveguide for transmitting the first beam of light, the first waveguide adapted to vibrate in response to vibration of the machine;

a second waveguide for transmitting the second beam of light, the second waveguide adapted to vibrate in response to vibration of the machine;

a third waveguide for transmitting the third beam of light, the third waveguide adapted to vibrate in response to vibration of the machine; and

a fourth waveguide having at least a portion thereof located within a predetermined distance to at least portions of the first, second and third waveguides, respectively, such that evanescent coupling occurs between the waveguides whereby the fourth waveguide transmits the at least portion of the beams of light to the receiving system;

wherein the intensity of the respective at least portion of the beams of light vary as a function of the vibration of the machine.

17. (Withdrawn) A system for sensing vibration of a machine, comprising:

a light source for directing a beam of light;

a beam splitter for splitting the beam of light into at least a first beam and a second beam;

an optical lateral resonating system for receiving the second beam, the optical lateral resonator reflecting the second beam, the optical lateral resonating system deflecting in response to vibration such that a transmission path of the second beam varies in length as a function of deflection of the optical lateral resonating system;

a receiving system for receiving an interference beam, the interference beam including a combination of the first beam and reflected second beam; and

a processing system for processing and analyzing the interference beam to facilitate determining vibration of the machine.

18. (Cancelled)

19. (Withdrawn) A system for sensing vibration of a machine, comprising:

means for directing a beam of light;

means for receiving at least a portion of the beam of light;

a first means for transmitting the beam of light, the first means adapted to vibrate in response to vibration of the machine; and

a second means for transmitting light, having at least a portion thereof located within a predetermined distance to at least a portion of the first means such that evanescent coupling occurs between the first and second means whereby the second means transmits the at least a portion of the beam of light to the means for receiving;

wherein the intensity of the at least a portion of the beam of light varies as a function of the vibration of the machine.

20. (Withdrawn) A system for sensing vibration of a machine, comprising:

means for directing a beam of light;

means for splitting the beam of light into at least a first beam and a second beam;

means for receiving the second beam, means for receiving the second beam reflecting the second beam, the means for receiving the second beam deflecting in response to vibration such that a transmission path of the second beam varies in length as a function of deflection of the means for receiving the second beam;

means for receiving an interference beam, the interference beam including a combination of the first beam and reflected second beam; and

means for processing and analyzing the interference beam to facilitate determining vibration of the machine.

Claims 21-32 (Cancelled).

33. (Previously presented) A system that determines a vibration state for a machine, comprising:

a light receiver that receives light from a source;

an obscuring body that based on a particular vibration state of a machine obscures a portion of light transmitted from the source to the light receiver, and

a processor that analyzes an amount of light received by the light receiver to determine the particular vibration state.

34. (Previously presented) The system of claim 33, the amount of light received by the light receiver increases with increased vibration state of the machine.

35. (Previously presented) The system of claim 33, the amount of light received by the light receiver decreases with increased vibration state of the machine.

36. (Previously presented) The system of claim 33, the obscuring body is a light modulating system.

37. (Previously presented) The system of claim 36, the light modulating system includes a housing with a first opening that receives a light beam, a second opening that allows passage of a light beam to the light receiver as a function of a vibration state of the machine.

38. (Previously presented) The system of claim 36, the light modulating system is attached to the machine.

39. (Previously presented) The system of claim 38, the light modulating system further comprises an annular structure.

40. (Previously presented) The system of claim 39, the annular structure permits light to pass in one direction.

41. (Previously presented) The system of claim 33, the processor determines a vibration state of the machine based upon an area illuminated on a surface of the light receiver.

42. (Previously presented) A system that senses a vibration level for a machine, comprising

a light receiving arrangement that receives light from a source;

an obscuring body that obscures a light directed upon the light receiving arrangement to cast a shadow fringe thereupon at a particular vibration level of a machine, the remaining light illuminates part or all of the light receiving arrangement as a function of the particular vibration level, and

a processor that analyzes the remaining light to determine the particular vibration level of the machine.

43. (Previously presented) The system of claim 42, further comprising a reflector that reflects the remaining light on to the light receiving arrangement.

44. (Previously presented) The system of claim 42, the processor analyzes an area of the light receiving arrangement that is illuminated *via* the remaining light to determine the particular vibration level of the machine.

45. (Previously presented) The system of claim 42, the processor analyzes a non-illuminated area of the light receiving arrangement to determine the particular vibration level of the machine.

46. (Previously presented) The system of claim 42 the obscuring body is a light modulator.

47. (Previously presented) The system of claim 46 the light modulator is connected to the machine.

48. (Previously presented) The system of claim 42 the shadow fringe turns to a complete shadow when the machine reaches a specific vibration level.

49. (Previously presented) A method of sensing a vibration state for a machine comprising:

illuminating a light receiving system *via* a light source;

obfuscating a light directed to the light receiving system to cast a shadow fringe thereupon as a function of the vibration state of a machine; and

analyzing amount of light reaching the light receiving system to determine the vibration state of the machine.

50. (Previously presented) The method of claim 49 further comprising modulating the light.

51. (Previously presented) A system for sensing a vibration of a machine, comprising:

means for receiving a light transmitted from a light source;

means for obscuring a portion of the light directed to the light receiving means such that a remaining light illuminates part or all of the light receiving means as a function of a vibration of a machine, and

means for analyzing amount of light received by the light receiving means to determine the particular vibration of the machine.

52. (New) A system that determines a vibration state for a machine, comprising:

a light receiver that receives light from a source;

a light modulating system, having an annular structure, that obscures a portion of light transmitted from the source to the light receiver based on a particular vibration state of the machine, and

a processor that analyzes an amount of light received by the light receiver to determine the particular vibration state of the machine.

53. (New) The system of claim 52, the annular structure allows light to pass in one direction.

54. (New) The system of claim 52, the light modulating system includes a housing with a first opening that receives a light beam and a second opening that permits the light beam to pass to the light receiver as a function of the vibration state of the machine.

55. (New) The system of claim 52, the light modulating system is attached to the machine.

56. (New) The system of claim 52, the processor determines the vibration state of the machine based upon an area illuminated on the surface of the light receiver.

57. (New) The system of claim 52, the amount of light received by the light receiver increased with increased vibration state of the machine.

58. (New) The system of claim 52, the amount of light received by the light receiver decreases with increased vibration state of the machine.